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"Chemical and Physical Studies on the Tissue Proteins Involved in Chemical Carcinogenesis"

Increase of Certain Soluble Liver Proteins Associated with Dye Binding during Aminoazo Dye Hepatocarcinogenesis in the Rat.

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Protein-bound dyes are present almost specifically in the livers of rats fed hepatocarcinogenic azo dyes and are absent in the induced tumors (Miller and Miller, Cancer Research, 7,468, 1947). The soluble bound dyes are relatively localized in an electrophoretic class ("h") of proteins (Sorof, Cohen, Miller and Miller, Cancer Research, 11: 383, 1951). These proteins are greatly reduced in quantity in the azo dye induced liver tumor (Sorof and Cohen, Cancer Research, 11:376, 1951).

Lankenau-Wistar rats of both sexes were fed ad libitum 0.06% 4-dimethylaminoazobenzene (DAB) for 32 days, or 0.057% of its 3'-methyl derivative (3'-Me-DAB) for 18-21 days, incorporated into diet #3 of Miller and Miller. Control rats were similarly fed the same diet without dye. Using the single sucrose density gradient as a barrier to convection (J. Am. Chem. Soc., 76:4740, 1954), the resolution of the "h" proteins has now been increased 27-fold, thereby revealing six distinct sub-components. Our findings to date indicate that the relative quantities of one of these "h" components from rats fed DAB or 3'-Me-DAB are respectively 76 and 62 per cent greater than their controls. By comparison, 3-days regenerated livers exhibit only a 10-20 per cent increase in this component. Evidence indicates that in the case of these dye fed rats this component represents azoproteins. Speculatively, and in possible agreement with the Miller "protein-delection" hypothesis (l.c.), the observed preneoplastic increase of this sub-class of "h" proteins may constitute an ultimately unsuccessful compensatory response against the effects of their binding of azo dyes.

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